REMARKS/ARGUMENTS

Applicants amended claim 8 to clarify the antecedent basis of the "second representation" element. Applicants request the Examiner to enter this clarification amendment because such clarification should not necessitate further searching.

1. Claims 1-29 are Patentable Over the Cited Art

The Examiner rejected claims 1-23 as obvious (35 U.S.C. §103(a)) over Crockett (U.S. Patent No. 5,504,861) in view of Callon (U.S. Patent No. 6,999,459) and Dias (U.S. patent No. 5,805,785). Applicants traverse for the following reasons.

Claim 1 recites a system for managing a network components, including storage devices and digital data processors, comprising: a first component that maintains a first representation of a topology of the storage devices and digital data processors in the network and that generates an event notification indicative of a change to the topology with respect to the network; a second component in communication with the first component, the second component maintaining a second representation of the topology and responding to the event notification by accessing the first representation; determining whether there is a discrepancy between the event notification and an attribute of any of the first and second representations; selectively disregarding the event notification or recovering the second representation from one or more attributes of the first representation in response to determining the discrepancy, wherein disregarding the event notification comprises taking no action to synchronize the first and second representations in response to the event notification.

The Examiner cited col. 2, lines 58-62 and col. 7, lines 34-44 of Crockett as teaching the requirements of these claims. (Final Office Action, pg. 3) The cited col. 2 mentions that an object is to provide a design to shadow write updates at a primary site to a secondary site so that the writes to the secondary site are optimized with full recovery capabilities. The cited col. 7 mentions specific sense information from the primary storage controller regarding the failure of an I/O write operation. An I/O ERP (error recovery program) on the primary controller may perform peer-to-peer synchronization error recovery to maintain data integrity between a primary and secondary storage controller.

Although the cited Crockett discusses maintaining data integrity between two sites where data is maintained, the cited Crockett nowhere teaches or suggests the specific claim requirements where the second component receives a notification, and in response the second component accesses the first representation, determines a discrepancy between an event notification indicative of a topology change, and then selectively disregards the event notification or recovers the second representation in response to the discrepancy. Instead, the cited Crockett discusses how updates are transmitted asynchronously from a primary site to a secondary site.

Further, the cited col. 7 discusses error recovery performed at the primary controller to synchronize for an error recovery. The I/O ERP 2 is on the primary controller, see, FIG. 1. This does not teach or suggest that the second component to be updated, which the Examiner likens to the secondary site, receives an event notification of a change and then performs the claimed operations of accessing the first representation, determining a discrepancy between an event notification indicative of a topology change, and then selectively disregarding the event notification or recover the second representation in response to the discrepancy.

Moreover, this rejection should be withdrawn because Crockett teaches away from the claimed technique for providing the topology changes to the second representation. Crockett mentions that the primary storage controllers each group their respective record updates for an asynchronous remote data shadowing session and provide those record updates to the PDM. Transferring record updates from the primary storage controllers is controlled by the PDM (Primary Data Mover). (Crockett, col. 10, lines 54-65). Thus, in Crockett the primary controller initiates the transferring of updates by providing the updates, whereas the claims require that the first component sends a notification to a second component that causes the second component to access the first representation at the first component, determine a discrepancy and disregard the notification or recover the second representation from attributes of the first representation in response to determining the discrepancy. Further, there is no teaching that disregarding the discrepancy comprises taking no action to synchronize the first and second representations in response to the event notification.

The Examiner further cited col. 7, lines 37-39 of Callon. (Final Office Action, pg. 3) Callon mentions that a notification is provided to switching nodes that a communication link has failed to allow the nodes to update their network topology database. (Callon, col. 7, lines 29-35)

The cited col. 7 mentions that a switching node notifies a network manager to determine the cause of a failure or notification. Nowhere does the cited Callon anywhere teach or suggest that in response to a notification of a change to the topology, that the notified component performs the operations of accessing the first representation, determining a discrepancy between an event notification indicative of a topology change, and then selectively disregarding the event notification or recovering the second representation in response to the discrepancy. Instead, notifies a network manager to determine the course of action.

The Examiner further cited col. 2, lines 28-33 of Dias as teaching the requirements of the claim concerning filtering events to ensure that needless events are not acted on. (Final Office Action, pg. 3) Applicants submit that this cited col. 2 of Dias also fails to teach the above discussed shortcomings of the above references with respect the combination of claim requirements.

The cited col. 2 of Dias mentions that events detected by monitors are sent to event handlers. The event handlers process events by filtering them through such activities as event correlation, removal of duplicate events, and rollup. Filtered events are given by event handlers to recovery drivers, which have a rule base which specifies user defined recovery programs corresponding to the events.

The cited col. 2 mentions that event handlers process events. However, as with the other cited references, nowhere does the cited col. 2 anywhere teach or suggest that in response to a notification of a change to the topology, that the notified component performs the operations of accessing the first representation, determining a discrepancy between an event notification indicative of a topology change, and then selectively disregarding the event notification or recovering the second representation in response to the discrepancy. Instead, the cited col. 2 discusses filtering events in general. Nowhere does the cited col. 2, or any other cited reference, teach or suggest selectively disregarding an event notification or recovering the second representation in response to determining a discrepancy between a first and second representations of a topology.

Accordingly, claim 1 is patentable over the cited art because the cited combination of Crockett, Callon, and Dias do not teach or suggest all the claim requirements.

Claims 2-7, 24, 26, and 28 are patentable over the cited art because they depend from claim 1, which is patentable over the cited art for the reasons discussed above. Moreover, the following discussed claims provide further grounds of patentability over the cited art.

Claim 2 recites that the network further includes a plurality of hosts, each coupled with one or more storage devices over the network; one or more agents each associated with one or more of the hosts, each agent generating a scan identifying attributes of any of (i) the host with which it is associated, (ii) one or more of the storage units to which that host is coupled, and (iii) a relationship therebetween; and wherein the agents are in communication coupling with the first component, wherein the agents transmit the scan to the first component.

The Examiner cited the above discussed sections of col. 2, lines 58-62, col. 9, line 52 to col. 10, line 9; col. 10, line 54 to col. 11, line 37 as disclosing the requirements of claim 2. (Final Office Action, pg. 4) Applicants traverse.

The cited col. 2 mentions that writes at a primary site are shadowed at a secondary site with full recovery capabilities. The cited cols. 9-10 discuss how applications at the primary site synchronize to a sysplex clock, and the cited cols. 10-11 discuss how record updates are gathered and sent to the secondary site. Nowhere do these cited sections of Crockett anywhere teach or suggest the claim requirements of agents generating a scan of hosts and storage units to which the host is coupled and the relationship, and that the agents transmit the scans to the first component.

The Examiner further found that agents are inherent in the design. Applicants submit that whether or not agents are "inherent", the Examiner has not cited any part of Crockett that teaches or suggests agents generating a scan identifying attributes of any of (i) the host with which it is associated, (ii) one or more of the storage units to which that host is coupled, and (iii) a relationship therebetween.

Accordingly, claim 2 provides additional grounds of patentability over the cited art because the cited Crockett fails to disclose all the additional requirements of claim 2.

Claim 7 depends from claim 1 and further requires functionality that recovers the second representation by performing at least one of the following operations: i) clearing the second representation and rebuilding that representation from attributes of the first representation; ii) comparing the first and second representations in whole or in part, and copying from the first representation to the second representation attributes missing from the latter, while any of

deleting or marking as missing attributes in the second representation indicative of components present in the second representation but not in the first representation; and iii) copying from the first representation to the second representation one or more attributes indicative of any of (a) a component or relationships represented by an attribute in connection with which the discrepancy occurred, and (b) a component or relationship in a region represented by an attribute in connection with which the discrepancy occurred.

The Examiner cited the above discussed sections of Crockett as disclosing the additional requirements of claim 7. (Final Office Action, pgs. 6-7) Applicants traverse.

As discussed, the above cited Crockett discusses how to mirror updates to a primary site to a secondary site. The Examiner has not cited any part of Crockett that teaches or suggests the specific claimed functionality that recovers the second representation by performing at least one of the following operations: i) clearing the second representation and rebuilding that representation from attributes of the first representation; ii) comparing the first and second representations in whole or in part, and copying from the first representation to the second representation attributes missing from the latter, while any of deleting or marking as missing attributes in the second representation indicative of components present in the second representation but not in the first representation; and iii) copying from the first representation to the second representation one or more attributes indicative of any of (a) a component or relationships represented by an attribute in connection with which the discrepancy occurred, and (b) a component or relationship in a region a component or relationships represented by an attribute in connection with which the discrepancy occurred.

In the cited sections of Crockett there is no mention or disclosure of the above discussed functionality to handle a discrepancy between an event notification concerning a change to a network topology and the first or second representations of that topology as claimed.

Accordingly, claim 7 provides additional grounds of patentability over the cited art because the cited Crockett fails to disclose all the additional requirements of claim 7.

Claim 8 recites a system for managing a network of components, including storage devices and digital data processors, comprising: a first component that maintains a first representation of a topology of the storage devices and digital data processors in the network and that generates an event notification indicative of a change to the topology with respect to the

network; a second component in communication with the first component, the second component maintaining a second representation of the network and responding to the event notification by: accessing the first representation; disregarding the event notification in response to determining at least one of: i) the event notification is indicative of addition of a new component to the network and an attribute of the first representation is indicative of absence of that component; ii) the event notification is indicative of addition of a relationship between components of the network and an attribute of the first representation is indicative of absence of that relationship; iii) the event notification is indicative of addition of a relationship between components of the network and an attribute of the second representation is indicative of the absence from the network of one of the components to that relationship; iv) the event notification is indicative of a missing component of the network and an attribute of the second representation indicative of the absence of that component from the; v) the event notification is indicative of a missing component of the network and an attribute of the second representation indicates representation of that component in the second representation, but the absence of that component from the; vi) the event notification is indicative of a missing relationship between components of the network and an attribute of the second representation indicative of absence of that relationship in the second representation; or vii) the event notification is indicative of a missing relationship in the network and an attribute of the second representation indicates inclusion of that relationship in the second representation, but the absence of that component from the network.

The Examiner cited the same sections of Crockett cited with respect to claim 1 against claim 8. (Final Office Action, pgs. 7-8) Applicants traverse.

Claim 8 is patentable over the cited Crockett for the reasons discussed with respect to claim 1, because claim 8 includes many of the limitations of claim 1 that distinguish over the cited Crockett. Further, claim 8 provides additional requirements concerning when the event notification is disregarded. Applicants submit that nowhere does the cited Crockett, Callon or Dias anywhere teach or suggest any one of the specific seven occurrences that result in disregarding an event notification on a topology change. Instead, the cited Crockett discusses copying updates to a secondary storage (DASD) to maintain a write order and the cited Dias discusses filtering events detected by monitors.

If the Examiner maintains this rejection of claim 8, Applicants request that the Examiner specifically cite to where Crockett, Callon or Dias teach or suggest the specific requirements that the notification is disregarded if one of the following occur:

the event notification is indicative of addition of a new component to the network and an attribute of the first representation is indicative of absence of that component from the topology;

the event notification is indicative of addition of a relationship between components of the topology and an attribute of the first representation is indicative of absence of that relationship from the topology;

the event notification is indicative of addition of a relationship between components of the topology and an attribute of the second representation is indicative of the absence from the topology of one of the components to that relationship;

the event notification is indicative of a missing component of the topology and an attribute of the second representation indicative of the absence of that component from the topology;

the event notification is indicative of a missing component of the topology and an attribute of the second representation indicates representation of that component in the second representation, but the absence of that component from the topology;

the event notification is indicative of a missing relationship between components of the topology and an attribute of the second representation is indicative of an absence of that relationship in the second representation; or

the event notification is indicative of a missing relationship in the topology and an attribute of the second representation indicates inclusion of that relationship in the second representation, but the absence of that component from the topology.

Accordingly, claim 8 is patentable over the cited art because the Examiner has not cited art teaching or suggestion the requirements of claim 8.

The Examiner cited the same sections of Crockett cited with respect to claim 8 against claim 9. (Final Office Action, pgs. 9-10) Applicants traverse.

Claim 9 is patentable over the cited Crockett (and other cited references) for the reasons discussed with respect to claim 8, because claim 9 includes many of the limitations of claim 8

that distinguish over the cited Crockett. Further, claim 9 provides additional requirements concerning determining the discrepancy and selectively recovering the second representations in response to any of the listed four occurrences. Applicants submit that the Examiner has not cited any part of Crockett, Callon, and Dias, alone or in combination, that teach or suggest any one of the specific claimed occurrences that result in selectively recovering the second representation.

Accordingly, claim 9 is patentable over the cited art because the requirements of claim 9 are not disclosed in the cited art.

Claim 10 includes the requirements of amended claim 1 in method format. The Examiner cited the same sections of Crockett with respect to claim 1 against claim 10, but did not cite Callon and Dias, as the Examiner did with claim 1. (Final Office Action, pgs. 10-11) Applicants submit that claim 10 is patentable over the cited art for the reasons discussed with respect to claim 1 because claim 10 includes the requirements of claim 1 in method form.

Claims 11-23, 25, 27, and 29 are patentable over the cited art because they depend from claim 10, which is patentable over the cited art for the reasons discussed above.

Claim 11 provides further details on the recovering operations to recover the second representation of the topology. Applicants submit that these recovery operations are not disclosed in the cited Crockett. Instead, the cited Crockett discusses copying updates to a secondary storage (DASD) to maintain a write order.

Claims 12-23 provide further details on the operations of determining the discrepancy which results in either disregarding the notification or recovering the second representation. Applicants submit that these further claimed details of determining the discrepancy in these claims is not disclosed in the cited Crockett because the cited Crockett discusses copying updates to a secondary storage (DASD) to maintain a write order, and does not disclose the claimed operations for determining a discrepancy between an event notification and attributes of one of the first and second representations.

Claims 24 and 25 depend from claims 1 and 10, respectively, and further require that the recovering of the second representation is performed in response to the determined discrepancy comprising the first representation not reflecting the change indicated by the event notification and the second representation reflecting the change indicated by the event notification.

The Examiner cited claims 5, 7, and 8 of Dias as teaching the additional requirements of these claims. (Final Office Action, pgs. 17-18) Applicants traverse.

The cited claim 5 mentions that failure events are reported to an event manager and that the event manager reports only selected ones of the events based on a filtering criteria. The cited claim 7 mentions monitoring nodes of a distributed system and subsystems, reporting detected events, filtering the events, and applying rules to filtered events to select a user defined recovery program. The cited claim 8 mentions that the filtering includes at least one of event correlation, removal of duplicate events, and rollup.

Although the cited claims of Dias mention filtering events and performing a recovery action based upon certain rules being applied to the events, nowhere do the cited claims of Dias anywhere teach or suggest the specific claim requirements of recovering the second representation in response to the determined discrepancy comprising the first representation not reflecting the change indicated by the event notification and the second representation reflecting the change indicated by the event notification.

Accordingly, claims 24 and 25 are patentable over the cited art because the requirements of these claims are not taught or suggested in the cited Dias or other cited art.

Claims 26 and 27 depend from claims 1 and 10, respectively, and further require that the event notification is disregarded in response to the determined discrepancy comprising the first representation and second representation not reflecting the change indicated by the event notification.

The Examiner discussed the above discussed claims 5, 7, and 8 of Dias as teaching the additional requirements of these claims. (Final Office Action, pg. 18) Although the cited claims of Dias mention filtering events and performing a recovery action based upon certain rules being applied to the events, nowhere do the cited claims of Dias anywhere teach or suggest the specific claim requirements that the event notification is disregarded in response to the determined discrepancy comprising the first representation and second representation not reflecting the change indicated by the event notification. Nowhere is there any teaching of the claim requirement of disregarding a notification if the first representation and second representation do not reflect the change indicated by the event notification.

Accordingly, claims 26 and 27 are patentable over the cited art because the requirements of these claims are not taught or suggested in the cited Dias or other cited art.

Claims 28 and 29 depend from claims 1 and 10, respectively, and further require that the event notification indicates that a device was added to the first representation, wherein the

recovering of the second representation is performed in response to the determined discrepancy comprising the first representation not reflecting the added device and the second representation reflecting the added device, and wherein the event notification is disregarded in response to the determined discrepancy comprising the first representation and the second representation not reflecting the added device.

The Examiner discussed the above discussed claims 5, 7, and 8 of Dias as teaching the additional requirements of these claims. (Final Office Action, pg. 18) Although the cited claims of Dias mentions filtering events and performing a recovery action based upon certain rules being applied to the events, nowhere do the cited claims of Dias anywhere teach or suggest the specific claim requirements of recovering the second representation if the first representation does not reflect the added device and the second representation reflects the added device, and disregarding the event notification if the first representation and the second representation do not reflect the added device.

Accordingly, claims 28 and 29 are patentable over the cited art because the requirements of these claims are not taught or suggested in the cited Dias or other cited art.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-29 are patentable over the art of record. Should any additional fees be required, please charge Deposit Account No. 09-0466.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

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